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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/760,574	01/16/2001	Jean-Christophe Francis Audonnet	454313.3154.1	2896

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EXAMINER	
ANGELL, JON E	
ART UNIT	**PAPER NUMBER**
1635	

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/760,574	AUDONNET ET AL.	
	Examiner	Art Unit	
	Jon Eric Angell	1635	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *84-118* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *84-118* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *attached* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claims 84-118 are currently pending in the application and are examined herein.

Response to Amendment

This Action is in response to the communication filed on 5/10/2005.

The Declaration under 37 CFR 1.132 filed 4/8/2005 is sufficient to overcome the rejection of claims 84-118 based upon U.S. Patent No. 6,376,473 B1 (Audonnet) in view of Klavinskis et al. (J. Immunol. Vol. 162, No. 1, pages 254-262; January 1, 1999) et al. under 35 U.S.C. 103 as well as obvious-type double patenting.

The declaration of Lorne Babiuk filed 4/8/2005 indicates that there would not have been an expectation of success for making a bovine vaccine in combination with a cationic lipid adjuvant. Harpin et al. (J. Gen. Virol. 1999, cited in the IDS filed 4/8/2005) has been submitted as a reference supporting the declaration. Harpin teaches that a cationic lipid used in combination with a bovine DNA vaccine (specifically, a DNA vaccine for BVDV) did stimulate virus-specific neutralizing antibodies in vaccinations compared to the naked-DNA vaccine alone (e.g., see abstract). However, the inclusion of the cationic lipid with the BVDV DNA vaccine abolished the protective effect of the DNA vaccine (e.g., see abstract; and paragraph bridging pages 3141-3142). As such, the declaration and the Harpin reference indicate that there would not have been an expectation of success for using a cationic lipid adjuvant in a bovine. Therefore the rejections under 35 USC 103 and under obvious-type double patenting are withdrawn.

However, after considering Babiuk's declaration and the teaching of the Harpin et al. reference, a new grounds of rejection under 35 USC 112, 1s paragraph is deemed appropriate for the reasons indicated herein.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 84-118 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Factors to be considered in determining whether a disclosure meets the enablement requirement of 35 USC 112, first paragraph, have been described by the court in *In re Wands*, 8 USPQ2d 1400 (CA FC 1988).

> *Wands* states on page 1404,
> "Factors to be considered in determining whether a disclosure would require undue experimentation have been summarized by the board in Ex parte Forman. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims."

The nature of the invention

The invention is drawn to a DNA vaccine comprising a bovine DNA vaccine and a cationic lipid. As such, the nature of the invention is a therapeutic composition.

The invention is in a class of invention which the CAFC has characterized as "the unpredictable arts such as chemistry and biology." Mycogen Plant Sci., Inc. v. Monsanto Co., 243 F.3d 1316, 1330 (Fed. Cir. 2001).

The breadth of the claims

In their broadest embodiments, the claims encompass a bovine DNA vaccine for BRSV, BVDV-1, BVDV-2, bPI-3 in combination with a cationic lipid that meets the structural limitations set forth in claim 84. The broad claims encompass thousands of different cationic lipids considering every possible lipid that meets the limitations set forth in claim 84. It is noted that dependent claims 99 and 118 specifically indicate that the cationic lipid is DMRIE.

The unpredictability of the art and the state of the prior art

It is noted that bovine DNA vaccines were known in the art. Specifically, a DNA vaccine for BRSV, BVDV-1 and BVDV-2 were taught in the art (e.g.,. see U.S. Patent No. 6,376,473 B1 (Audonnet; previously cited) and Harpin et al. (1999, cited by applicants). Furthermore, cationic lipids were also known as adjuvants that enhanced the efficacy of DNA vaccines in mammals (e.g., Klavinskis et al. (J. Immunol., 1999)). It is noted, however, that Klavinskis does not teach that the cationic lipid is efficacious in bovines. However, Harpin et al. teaches that a cationic lipid (DOTAP) used in combination with a bovine DNA vaccine for BVDV did stimulate virus-specific neutralizing antibodies in vaccinations compared to the naked-DNA vaccine alone but abolished the protective effect of the DNA vaccine (e.g., see abstract; and paragraph bridging pages 3141-3142). As such, Harpin clearly demonstrates, absent evidence to the contrary, that although cationic lipids may enhance the antibody response to an antigen in

bovines, the cationic lipid is not effective as an adjuvant for a DNA vaccine in bovines because the cationic lipid abolishes the protective effect of the DNA vaccine.

Furthermore, the Harpin reference demonstrates that the presence of neutralizing antibodies is not predictive of a protective response.

Working Examples and Guidance in the Specification, Additional Experimentation

It is noted that the specification discloses, "The subject of the present invention is also an improved DNA vaccine capable of inducing an effective and protective immune response in bovines against the bovine respiratory syncitial virus (BRSV)" (see page 13, second paragraph; Emphasis added). As such, the specification defines DNA vaccine as a composition that can induce an effective and protective immune response in bovines.

The specification discloses that the cationic lipid DMRIE-DOPE enhances the antibody response to BHV-1 when the cationic lipid was used as an adjuvant in combination with a DNA vaccine for BHV-1 (see Example 16, pages 65-66). The specification does not disclose if using the cationic lipid adjuvant in combination with the DNA BHV-1 vaccine resulted in a protective response to BHV-1. In view of Harpin et al., and absent evidence to the contrary, it is unpredictable if the bovine DNA vaccine in combination with a cationic lipid would produce an effective and protective immune response. As such, additional experimentation would be required in order for one of skill in the art to use that claimed invention. Considering the teaching in the art that cationic lipids abolish the protective effect of DNA vaccines in bovines, the additional experimentation is considered undue.

Level of the skill in the art

The level of the skill in the art is deemed to be high.

Conclusion

Considering the nature of the invention, the breadth of the claims, the unpredictable nature of the invention as recognized in the prior art, the limited amount of working examples and guidance provided, and the high degree of skill required to practice the invention, it is concluded that the specification does not provide an enabling disclosure for the instant claims. Therefore, additional experimentation is required before one of skill in the art could make and use the claimed invention. In view of Harpin et al. that cationic lipids abolish the protective effect of DNA vaccines in bovines, the additional experimentation required to perform the broadly claimed invention is undue.

Response to Arguments

Applicant's arguments, see pages 11-19 of the communication filed 5/10/05, with respect to the rejection of claims under 35 USC 103 and obvious-type double patenting have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made for the reasons indicated herein.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jon Eric Angell whose telephone number is 571-272-0756. The examiner can normally be reached on Mon-Fri, with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John LeGuyader can be reached on 571-272-0760. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jon Eric Angell, Ph.D.
Art Unit 1635

Anne-Marie Falk

ANNE-MARIE FALK, PH.D
PRIMARY EXAMINER